

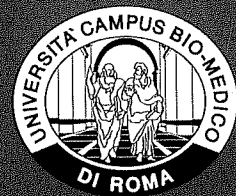
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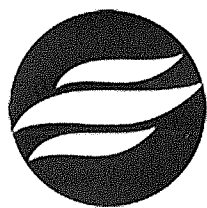
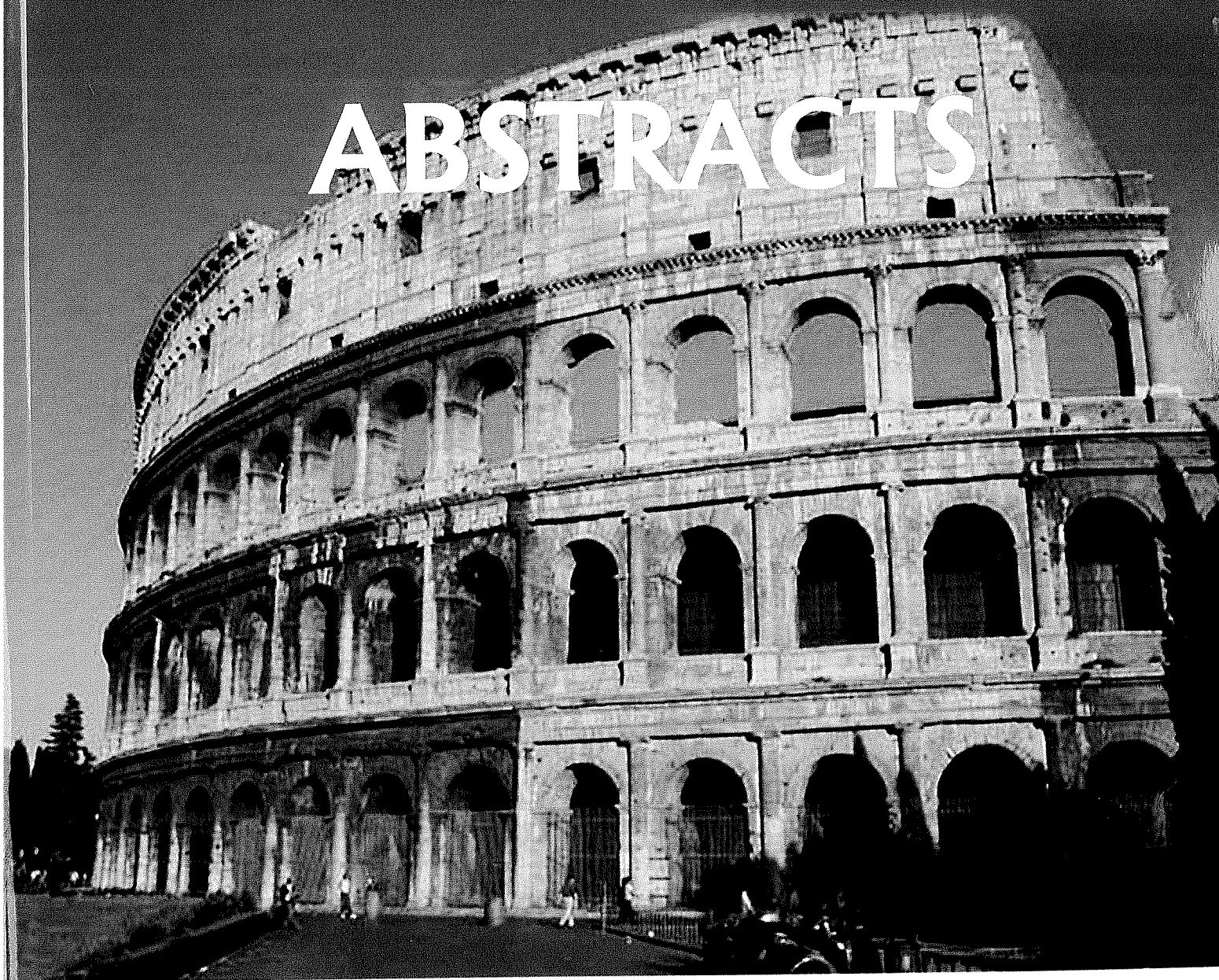


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ABSTRACTS



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Effects of pre-ozonation in case of microfiltration of oil contaminated waters using polyethersulfone membrane at various filtration conditions

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Nowadays an important challenge is to develop effective and economic water treatment processes for the purification of oil contaminated waters. Membrane separation is a very promising treatment, which can remove oil content, even in case of small droplets ($d < 2 \mu\text{m}$) and/or low contaminant concentration, however membrane fouling is a limiting factor for the economic applicability. Advanced oxidation processes (e.g. ozonation) combined with membrane separation are intensively investigated with the aim of reduced membrane fouling and/or to enhance purification efficiency. These properties may depend on the applied pressure and stirring intensity during the filtration, and optimal parameters can be changed by the presence or absence of ozone-pretreatment. In the present study the effects of applied pressure and stirring speed were investigated using polyethersulfone (PES) membrane ($d_{\text{pore}} = 0.2 \mu\text{m}$) in case of oil in water emulsion ($c_{\text{oil}} = 100 \text{ ppm}$; $d_{\text{oil droplets}} < 2 \mu\text{m}$) with and without applying pre-ozonation. Removal efficiency was determined by measuring COD, TOC and extractable oil content (TOG/TPH analyser). The effect of ozonation on the size of the oil droplets and on the zeta potential of the emulsion was determined by dynamic light scattering measurements. Fluxes and fouling models were also measured and calculated in case of all the investigated parameters to give a whole picture about the correlations of investigated parameters.

Keywords: Ozonation, Microfiltration, Polyethersulfone, Oil contaminants, Pressure

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